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Combat Crew

strategic air command

MARCH 1981

ANNIVERSARY ISSUE

U.S. DEPOSITORY

FROM THE CINC . . .

Those who do not
remember the past are
condemned to relive it.
George Santayana

General Richard H. Ellis
Commander in Chief, SAC

March 21, 1946 — the Strategic Air Command was created as the strategic air arm of the United States Armed Forces. By the end of its first year, SAC had amassed a combat "armada" of 148 B-29 bombers and assigned them to six out of nine authorized very heavy bomber groups . . . the remaining three groups had no aircraft. During 1946, SAC's 37,000 personnel were also responsible for maintaining another 130 fighter, reconnaissance and transport planes scattered among 18 bases, all within the continental United States.

From this humble beginning, the 120,000 men and women of today's Strategic Air Command are responsible for the readiness and operation of the vast majority of America's strategic nuclear forces —which represent some 70 percent of all U.S. strategic delivery vehicles and a significant portion of the total deliverable megatonnage. Operating around the world, the strength and readiness of the Command now stand as the foundation upon which is built our country's great economic, political and diplomatic system.

The last three and a half decades have been proud ones for SAC. The Command — and its people — have never failed to meet the increasing demands of the mission and have earned a worldwide reputation of complete professionalism. Now, I realize "professionalism" is probably the most over used word in the military vocabulary. Nevertheless, it symbolizes, in a single word, the personal qualities that our profession demands: toughness, discipline, dedication, sacrifice, and integrity. These qualities have served us well these many years and will be essential in the future as we prepare to meet the challenges of the decade ahead.

Deterring nuclear aggression and maintaining the capability to project strategic forces great distances at a moment's notice are tasks whose terms are absolute . . . there are no acceptable "degrees" of being prepared for combat. You either are or you aren't. Every action you take — whether it's on the flight line, in the silo or as part of our many vital support functions — must contribute in a positive way to the Command's readiness if it is to fulfill its critical responsibilities to the nation.

From the past 35 years have also come hard-learned lessons on how to do things right. During that time, a great deal of valuable, irreplaceable equipment has been destroyed and, of even greater importance, lives have been lost. Although some mishaps were attributable to machines breaking, far too many were due to "personal error." A mishap . . . any mishap . . . is a terrible thing — but when the cause is inattention, sloppy procedures, incomplete training, poor supervision or just plain carelessness, it is absolutely intolerable.

Of all the lessons we have learned over the years, the most important has been that the majority of mishaps can be avoided if everyone involved is properly trained and supervised. That means from the crew member, to the missile or aircraft maintenance specialist, to the wing commander — everyone in this Command is responsible for ensuring the next person down the chain has been trained to do his or her job right, has the proper tools to complete the assigned task and is supervised correctly. Training and supervision — that's what safety, and staying alive, is all about.

As we celebrate our 35th anniversary, I am confident the members of this Command will continue to meet their responsibilities as Air Force professionals dedicated to protecting our nation and preserving world peace. It is with this in mind that the emblem commemorating this point in our history was designed.

PROUD of the past,
PREPARED for the future
. . . PROFESSIONAL

Combat Crew

Magazine of the Strategic Air Command - 31st Year of Publication

GEN. RICHARD H. ELLIS
COMMANDER IN CHIEF, SAC

BRIG. GEN. HAROLD J. M. WILLIAMS
Inspector General

COL. RICHARD A. PATRICK
Director of Safety

STAFF

CAPT. ROSS W. PHILLIPPE
Editor

G. FRANCIS FARRELL
Associate Editor

SSgt. DAVE WADE
Art Editor

MARY JANE ABBOUD
Editorial Assistant

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ON OUR COVER
Salute to SAC's 35th Anniversary

SACRP 127-1 **VOL. XXXI NO. 3** **MARCH 1981**

COMBAT CREW is an internal publication of the Strategic Air Command with the sole purpose of promoting safety The contents of this magazine are informative and not to be considered as directive in nature Facts, testimony and conclusions of all mishaps printed herein may not be construed as incrimination under Article 31 of the Uniform Code of Military Justice. All names, dates and places used in conjunction with mishap stories are fictitous. Written permission must be obtained from Headquarters, Strategic Air Command, before any material may be reprinted by other than U.S. Air Force organizations Use of funds for printing this publication has been approved by Hq USAF. Distribution FX, controlled by IGFC. SAC units submit distribution requests through local PDO

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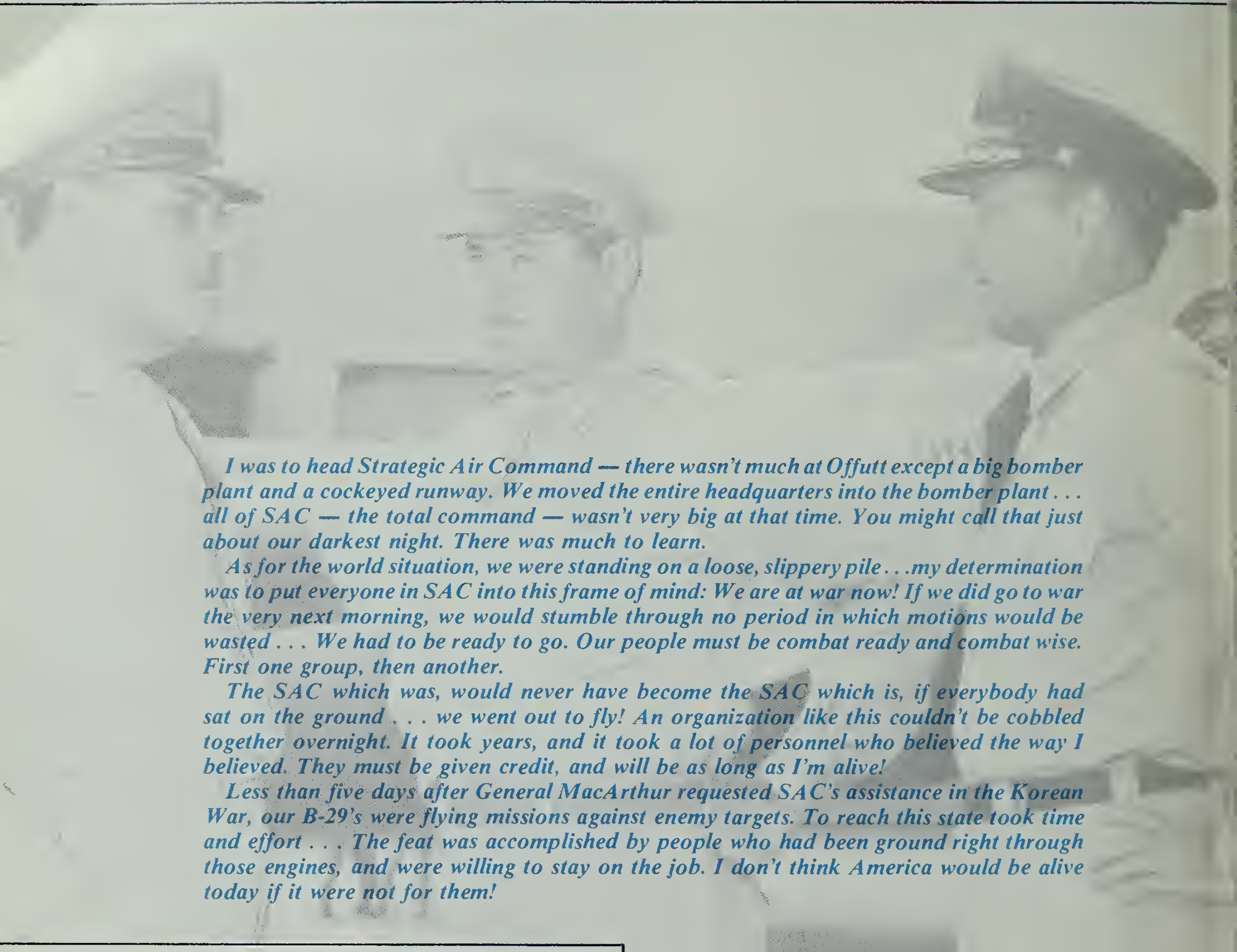
THIRTY-FIVE YEAR



I was to head Strategic Air Command — there wasn't much at Offutt except a big bomber plant and a cockeyed runway. We moved the entire headquarters into the bomber plant . . . all of SAC — the total command — wasn't very big at that time. You might call that just about our darkest night. There was much to learn.

As for the world situation, we were standing on a loose, slippery pile . . . my determination was to put everyone in SAC into this frame of mind: We are at war now! If we did go to war the very next morning, we would stumble through no period in which motions would be wasted . . . We had to be ready to go. Our people must be combat ready and combat wise. First one group, then another.

The SAC which was, would never have become the SAC which is, if everybody had sat on the ground . . . we went out to fly! An organization like this couldn't be cobbled together overnight. It took years, and it took a lot of personnel who believed the way I believed. They must be given credit, and will be as long as I'm alive!

Less than five days after General MacArthur requested SAC's assistance in the Korean War, our B-29's were flying missions against enemy targets. To reach this state took time and effort . . . The feat was accomplished by people who had been ground right through those engines, and were willing to stay on the job. I don't think America would be alive today if it were not for them!

General Curtis E. LeMay
Remarks from his book, "Mission With LeMay," 1965.

STRATEG

COMBAT CREW

S FOR the

Strategic Air Command observes its 35th anniversary this month — the historic date, March 21. On that day more than three decades ago, SAC was established as a separate command of the United States Air Force, and the men of the new organization set out to build a strategic air arm second to none.

THE HERITAGE

Although the theory of strategic bombing goes back to the days of World War I and General Billy Mitchell, 1935 is referred to as one of the most important milestones in strategic air power. That year saw the production of the four-engine B-17, Flying Fortress, a long range bomber that demonstrated for the first time the potential possibilities of strategic air power. Actually, the B-17 was to have the opportunity to prove itself much sooner than expected. Within five short years, the Japanese struck at Pearl Harbor on December 7, 1941, and the United States found itself engaged in a worldwide struggle for survival. All too soon the need for a vastly larger fleet of long range bombers was obvious, and a hard-pressed nation set out to build that force as quickly as possible.

The air fleet was built and before the leaders of the free world met at the historic Casablanca Conference of January 1943, the belief of American air leaders in the doctrine of strategic bombing had been justified. In Europe, the Germans had already felt the devastating effect of large-scale, daylight bomber attacks made by the Eighth Air Force in England and the Fifteenth Air Force in the Mediterranean Theater. The stated objectives of these attacks — "The destruction and dislocation of the German military, industrial and economic system and the undermining of the morale of the German people to the point where their capacity for armed resistance is fatally weakened."

So, for the first time in history, there developed an air war with a strategy and tactics all its own. Shortly thereafter, on April 16, 1945, General Carl Spaatz was able to announce: "The strategic war in Europe has been decisively won." Then and only then was the nation able to turn its full attention to the war with Japan, and soon that enemy was to feel the full power of strategic bombing. The extraordinary damage inflicted on the Japanese homeland by strategic bombing, coupled with the atomic bomb drops on Hiroshima and Nagasaki, were ultimately responsible for the victory over Japan that came without a costly ground invasion. Thus, World War II drew to an end as the air campaigns in Europe and the Far East demonstrated once and for all the military potential of air power and the important significance of strategic bombing.

1946-1981

Within a year after the cessation of hostilities, a nation more wise in the ways of war directed the establishment of the Strategic Air Command. Designed to concentrate the global strategic bombardment force in a single command, the new organization was formed at Bolling Air Force Base under the command of General George C. Kenny. Given the responsibility for developing a strategic

IC AIR COMMAND

atomic striking force that would serve to protect the peace through massive deterrent power, SAC had an awesome task to accomplish in the coming years. But under the leadership of commanders in chief from General Kenney to General Ellis, and through the evolution of concepts and strategies, the command molded itself into a highly trained and dedicated force that grew into the professional strategic fighting force we know today. Also under their guidance, the early assigned World War II aircraft gave way to the post war propeller driven bombers — the B-17, and B-29 are in this category. In 1948, two new aircraft — the B-36 and B-50 — were delivered to SAC and inflight refueling was introduced giving SAC's bombers intercontinental range. It was also in that year that General LeMay took command and SAC Headquarters was relocated at Offutt AFB.

During the Korean War, SAC B-29s made history in their first real test of combat readiness, dropping 167,000 tons of conventional bombs and destroying every strategic industrial target in North Korea in three months. In August 1953, the explosion of the first Soviet hydrogen bomb emphasized the nuclear threat and all phases of SAC training were pushed ahead at full speed.

New aircraft were swiftly introduced to replace older obsolete systems. By the mid-fifties, the first all-jet B-47 bomber had replaced B-29s and B-50s. At that time, the KC-97 was the main refueling tanker. Before General LeMay's reassignment in 1957. SAC's inventory included the B-52 and KC-135 and the non-stop around the world "Power Flite" of three B-52s had demonstrated the command's worldwide capability.

By the end of the fifties, one-third of the bomber force was on 15-minute ground alert, and airborne alert and dispersal concepts were being tested to counteract decreasing warning times.

General Thomas S. Power, SAC's third commander, supervised the integration of intercontinental ballistic missiles into the force during his tour from 1957 to 1964. Atlas and Titan wings were activated in 1958 and Snark, Hound Dog, and Minuteman soon became familiar terms in describing the mixed force of manned and unmanned systems.

When the Cuban missile crisis erupted in 1962, SAC was ready. With B-47s poised for immediate takeoff, B-52s flying airborne alert, and the growing missile force on alert, the command formed a strategic umbrella under which American diplomacy was able to resolve the tense situation.

In 1962, the last B-52H and B-58 rolled off the assembly line and for the first time since 1946, U.S. bomber production came to a halt. This was not to change until 1969 when the FB-111 entered the inventory and replaced its supersonic predecessor, the B-58. The B-58 had both finished production and was phased out of the inventory within the same decade. Also, during the sixties, we saw the RB-57, the B-47, the KC-97 and the Atlas ICBM's phased out.

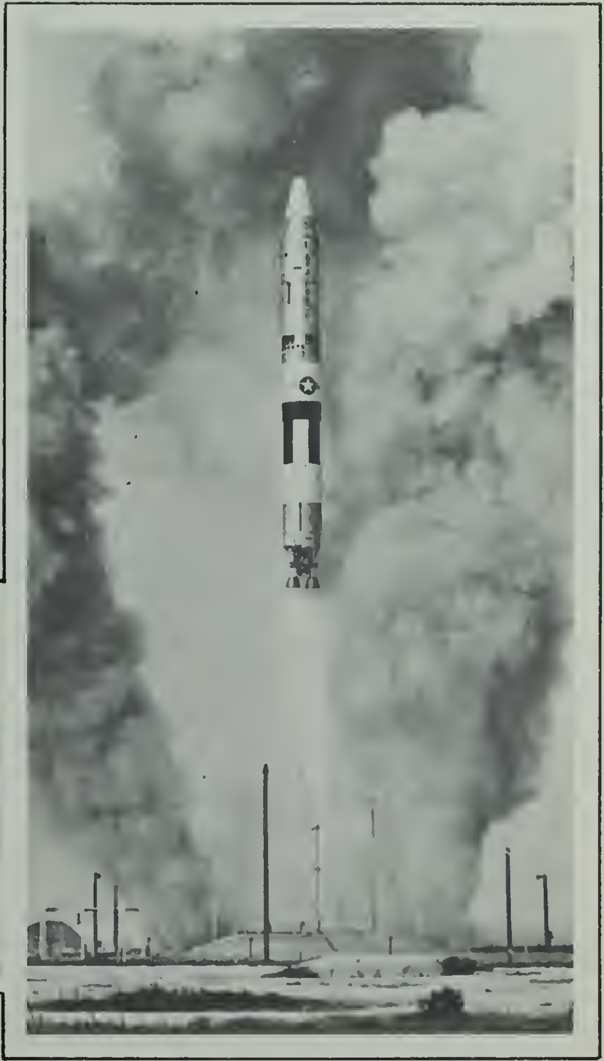
As we entered the seventies, work was well underway on a new advanced strategic bomber, the B-1. However, the program was cancelled, and the only new aircraft to be added to SAC's inventory during the seventies was the E-4.

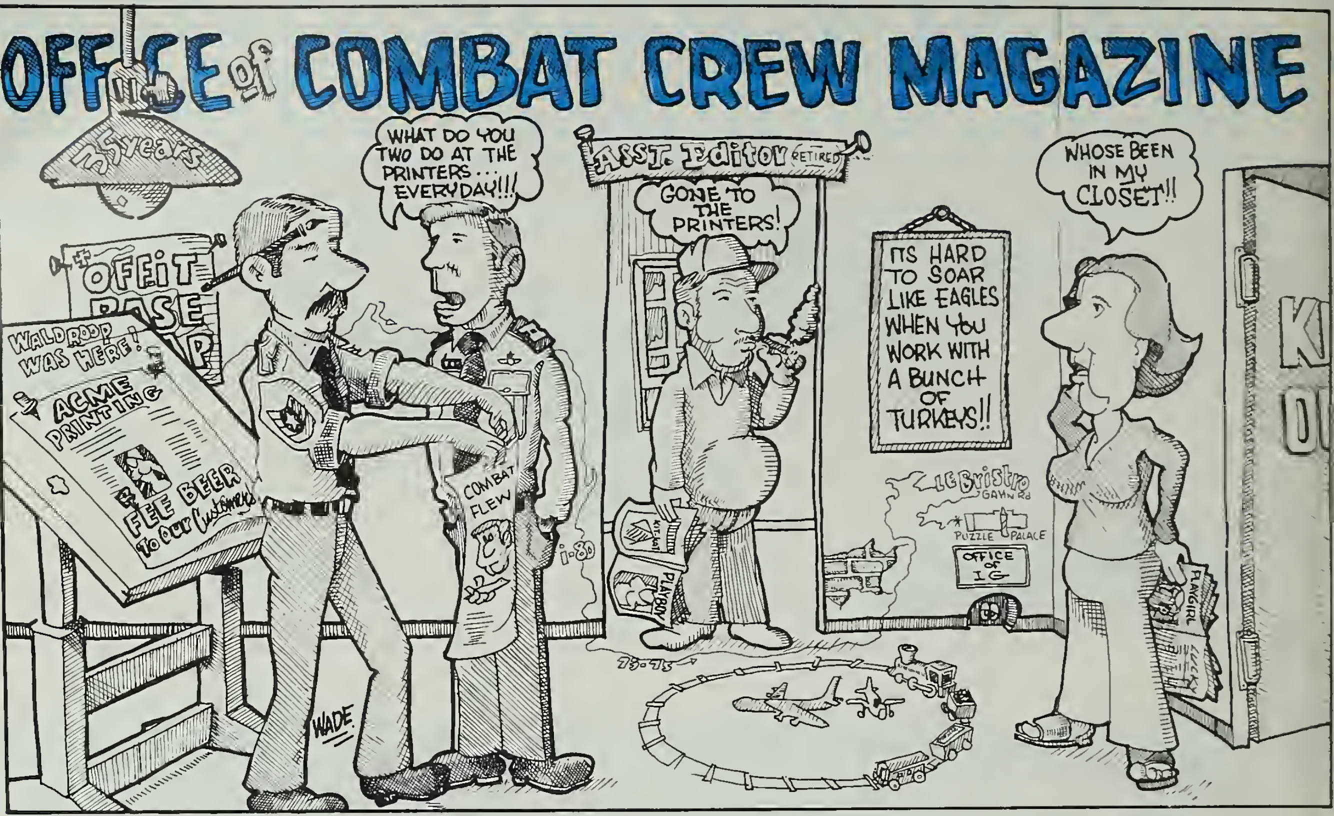
Attention was devoted toward increasing the capabilities of our B-52 and Minuteman fleet. Development of the SRAM missile and the EVS for G&H model B-52s and Minuteman II and III force modernization programs were just a few of the many improvements made to increase our strategic flexibility. We left the seventies with essentially the same weapons systems we had entered with, but we had vastly improved their capability to deal with the increasing nuclear threat.

As we move into the eighties, we are looking toward many changes. Newer weapon systems and better ways of increasing SAC's effectiveness are being planned or are already in progress. The Cruise

Missile and the KC-10 are currently under development and the M-X is moving ahead toward reality. The B-52 and KC-135 will continue to be upgraded and will be around for many years. Also the long sought advanced bomber may also appear on the scene. Besides the hardware improvements, we are also hearing more about Busy Prairie, Strategic Projection Force and Global Shield. These programs are designed to enhance and test our strategic flexibility and are the forerunners of future efforts.

Faced today with straining budgets and the increased Soviet strategic buildup, our leaders continue to stress the need for increased modernization. The quality improvements currently being planned and those yet to come will be essential for the maintenance of realistic and credible deterrence in the years ahead. If SAC's past history is any indicator, we will meet the challenge.




OFFICE of COMBAT CREW MAGAZINE
35 years
WHAT DO YOU TWO DO AT THE PRINTERS... EVERYDAY!!!
ASST. Editor RETIRED
GONE TO THE PRINTERS!
WHOSE BEEN IN MY CLOSET!!
OFFiT BASE
WALDROOP WAS HERE!
ACME PRINTING
FEE BEER To Our Customers
COMBAT FLEW
i-80
KIT-KAT
PLAYBOY
ITS HARD TO SOAR LIKE EAGLES WHEN YOU WORK WITH A BUNCH OF TURKEYS!!
LE Bristro
GAHN Rd
PUZZLE PALACE
OFFICE OF IG
PLAYGIRL
LUCKY
75-75
WADE

In June of 1980, Combat Crew Magazine celebrated its 30th anniversary. The Command journal was established by General Curtis LeMay to provide SAC crews with details of major aircraft accidents and how they might avoid similar tragedies. This idea, working in conjunction with the overall safety effort has proved its worth and in 1978 SAC experienced only one Class A mishap for an all time low rate of .28.

Today, most of the information regarding the causes of our Class A mishaps is electronically transmitted shortly after the accident board decides its findings and recommendations. This information is then readily available to be briefed to all crewmembers and would be old hat by the time it was read in the magazine. We, on Combat Crew, now shift emphasis toward personal experience narratives about the control of serious weapon system malfunctioning, the development of unforeseen hazards and professional motivation for doing the job better.

The content of the magazine can be broken down into four basic areas with information that will help the reader develop a greater insight toward the flying or missile activities. The four areas include: the editorial; recurring sections authored by staff personnel including R&D corner, Big Instrument and CFIC corner; safety recognition which includes professional performers, safety screen and hall of fame sections and most important articles from crewmembers. It is this area which primarily fulfills Gen LeMay's intent when he established Combat Crew magazine.

Professional Performers, Hall of Fame, and Safety Screen have been set aside to recognize individuals or units which have effectively contributed to the SAC safety effort. We try to reserve the professional performers section for those individuals or crews which have promoted safety through outstanding efforts in their job area.

We know many such instances occur, especially in the flying area, but few of these are forwarded for possible use in the magazine. AFR 127-2 SAC Sup 1 contains the submittal criteria and we encourage all units to actively participate in this program. The headquarters staff will select an individual or crew which fits the criteria for the following areas. Pilot of the month, Titan Crew of the Month, Minuteman Crew of the Month, Heads Up Flying Club, Maintenance Man of the Month and Safety Man of the Month. Nominations should not be submitted to fill a square but be used instead as a means of identifying outstanding effort within the unit. Pictures should always be provided.

The Safety Screen allows us to recognize a greater number of personnel but by name only. The criteria is much the same as above and those not selected for the professional performer pages will be used in this section.

AARDVARK
by DAVE WADE
WHATS AN AARDVARK?
I DON'T KNOW, BUT I HOPE ITS ONE OF OURS!

GILLETTE, WHEN I SAID,"PULL THE AARDVARK OFF THE LINE,"I DIDN'T MEAN...

The Hall of Fame honors those units that have demonstrated outstanding safety program effectiveness. The criteria for entry into the Hall of Fame is four years of Class A mishap free experience.

As mentioned before crewmember articles are the mainstay of the magazine. It is your experience and knowledge that is important and can be so effective in reaching not only your peers but the SAC staff as well. The time you take to set down your ideas or your experience can be of benefit to the entire command.

We have levied a requirement in the SAC supplement for each SAC base, to insure a flow of articles is received. These articles are normally forwarded through the NAF for screening. However, if you have a good article you may also forward it direct to the editor. All articles are read and considered for possible publication.

We cannot guarantee all of the articles received will be printed. However, any articles that have been carefully thought out and convey a theme that is of current importance will not be forgotten. Instead they will be held for possible use in future issues.

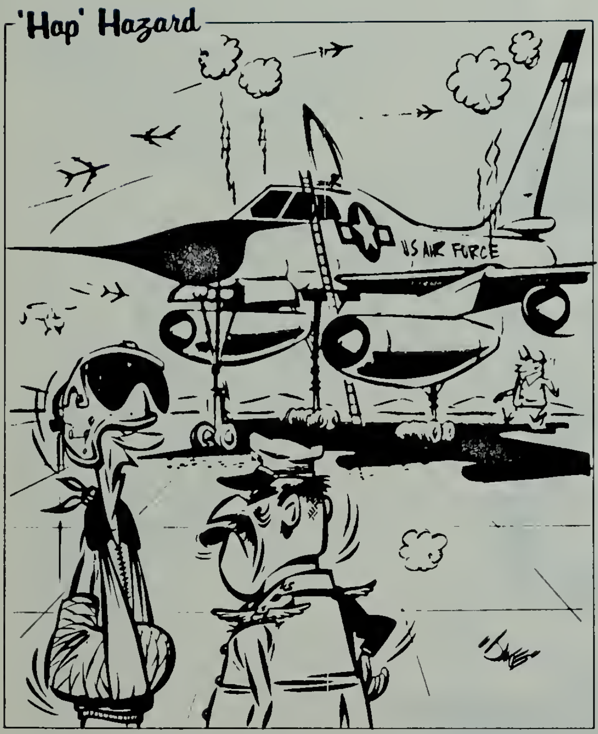
Because of our publication schedule, expect two to three months minimum before you see your article in print once it has been selected.

Combat Crew is the primary function of the safety education division under the safety directorate, Hq SAC. The safety directorate itself comes under the Hq SAC IG. Although the magazine is the first function of the division, the division also handles USAF safety awards nominations, coordination on the SAC safety seminar and edits the SAC Safety Newsletter. The division currently has a staff of four: chief of safety education/magazine editor, associate editor, editorial assistant and art editor.

The safety education division also works in concert with the other safety disciplines which includes flying, ground, missile and nuclear safety. It is in these disciplines where safety policy is formulated, safety regulations are written and safety program guidance is passed down to the units.

You, the crewmember, have a dramatic effect on this entire process in both a positive and negative manner. It is a negative effect when we have a mishap. It does not matter if it is a Class A, B or C, only the workload differs. The effect of this effort may result in changes to training programs, tech data criteria, and safety programs, hopefully for the better. A positive effect is the feedback you generate. This can come from your articles, hazard reports submitted, suggested tech data changes or other through channels correspondence to the various staff agencies at the NAF or Hq SAC.

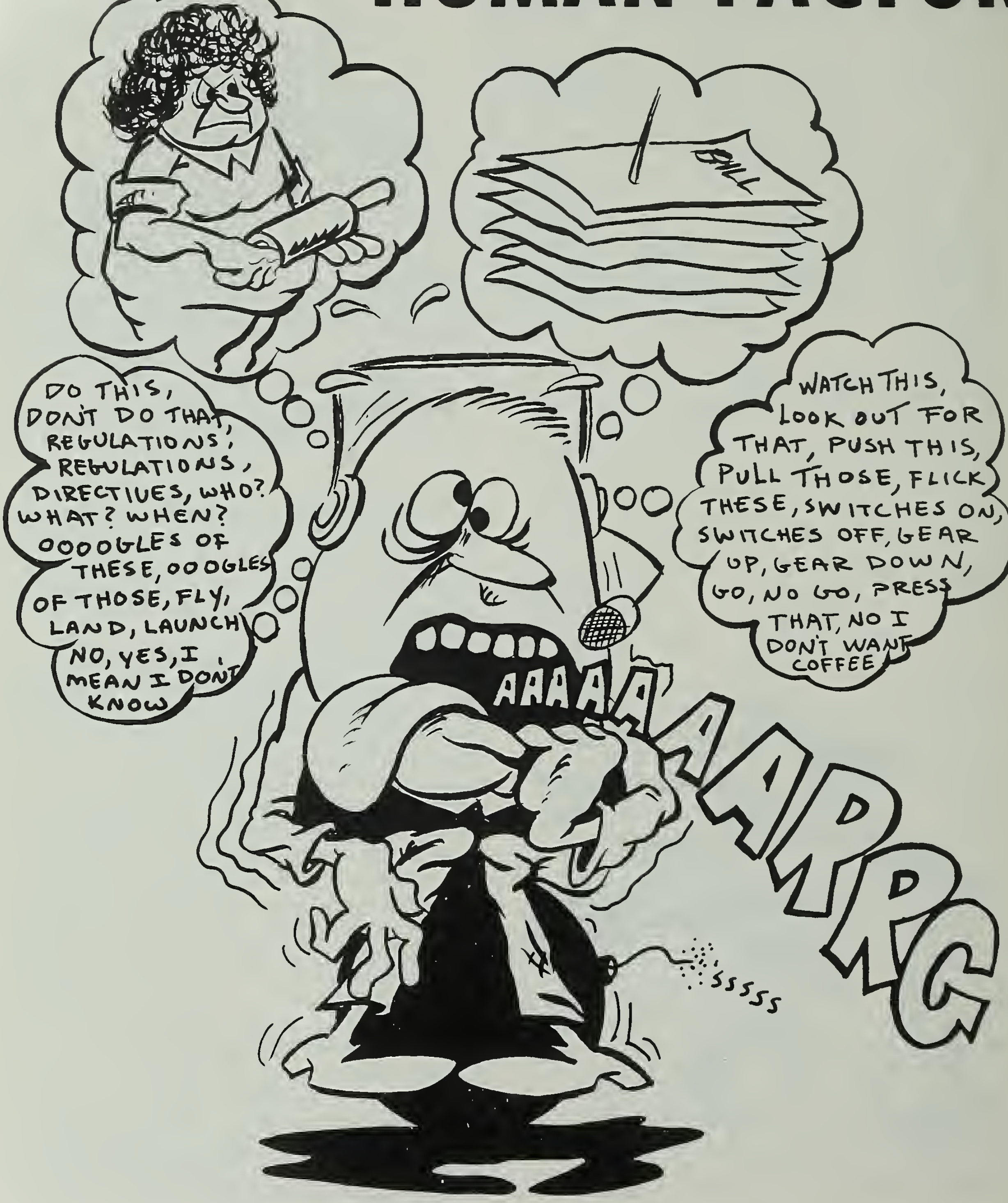
This feedback is necessary to insure the policies, programs and taskings are as safe and effective as possible. If we keep the positive information flowing maybe we can prevent that next Class A mishap.



"I was tooling along at mach 2 and ran into heavy traffic, so I put my arm out to indicate a right turn—"

In December 1978, CINCSAC submitted a Change Pace recommendation to Hq USAF/IG to stimulate increased human factors research. The recommendation called for increased involvement of human factors experts in mishap investigations and increased management/aircrew awareness of human factor elements. The Air Staff assigned the School of Aerospace Medicine OPR for the human factors research and develop effort. The R&D plan was completed on 28 June 1979 and its implementation is expected to be complete sometime in 1984. Major Santilli is currently the program manager for this effort. The following article was taken from a briefing he prepared for the SAC safety seminar held at Carswell AFB in November 1980.

HUMAN FACTORS


BILL
DO THIS, DON'T DO THAT, REGULATIONS, REGULATIONS, DIRECTIVES, WHO? WHAT? WHEN? OOOOGLES OF THESE, OOOGLES OF THOSE, FLY, LAND, LAUNCH NO, YES, I MEAN I DON'T KNOW
WATCH THIS, LOOK OUT FOR THAT, PUSH THIS, PULL THOSE, FLICK THESE, SWITCHES ON, SWITCHES OFF, GEAR UP, GEAR DOWN, GO, NO GO, PRESS THAT, NO I DON'T WANT COFFEE
AAAAAAAARRG
SSSSS

IN MISHAPS

...the psychological anomalies of attention

Major Stan Santilli
School of Aerospace Medicine
Brooks AFB

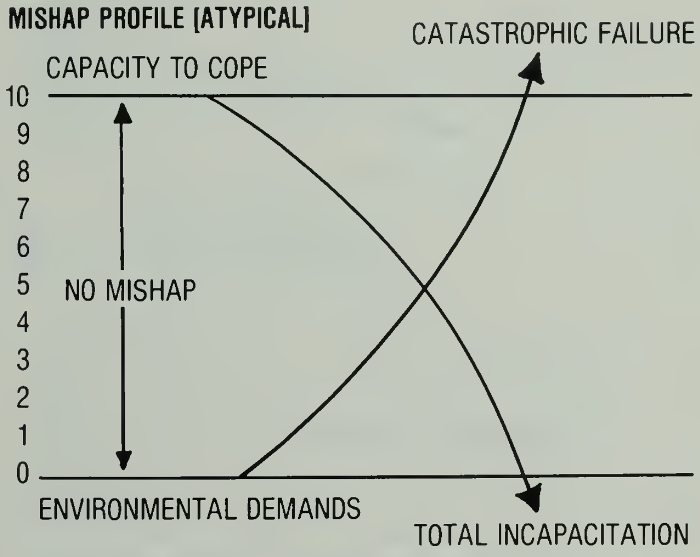
In 1917, the WWI SPAD aircraft had a total of 14 knobs, handles, dials, etc., for the pilot to either move or monitor during a mission. Twenty-five years later, 1942, the P-51 sported 53 knobs, handles, dials, etc.; and about 25 years after that, came the F-15 with over 450 different gizmos for the pilot to push, pull or watch. This advance in technology has significant implications for safety, whether in flying, nuclear, explosive or ground. The success of these systems is dependent on the human beings who build them, operate them and maintain them.

Many of the present systems would be better if we had had a more complete knowledge of past human behavior and had taken advantage of what we did know at the time. It is imperative that we now develop this knowledge and put it to use toward reducing our mishap potential.

One of the reasons the human element hasn't been adequately considered is the lack of understanding of the dynamics of human behavior and how it varies in different situations. This lack of understanding explains the high proportion of mishaps attributable to human error — but it doesn't excuse it.

What is human factors in the sense of mishap causation? If you ask a human engineer, he'll say "It's crew station design and anthropometrics." If you ask a physiologist, he'll say, "It's hypoxia, hyperventilation and trapped and evolved gas effects." If you ask a physchologist, he'll tell you that it has to do with learning, information processing and cognition. A pathologist will emphasize the effects of disease and drugs. A sociologist will tell you that it has to do with personality, life event stresses and social relationships. To a life support specialist, it has to do with egress and survival equipment. All of these responses are correct — but not completely! Human factors include all of those disciplines mentioned and more, because it deals with all of that which affects human behavior.

In a study of these human factors and how best to deal with them we must consider man's limitations, we must consider the environment in which he will be working and we must consider how man, with all his limitations, will interface with that environment.

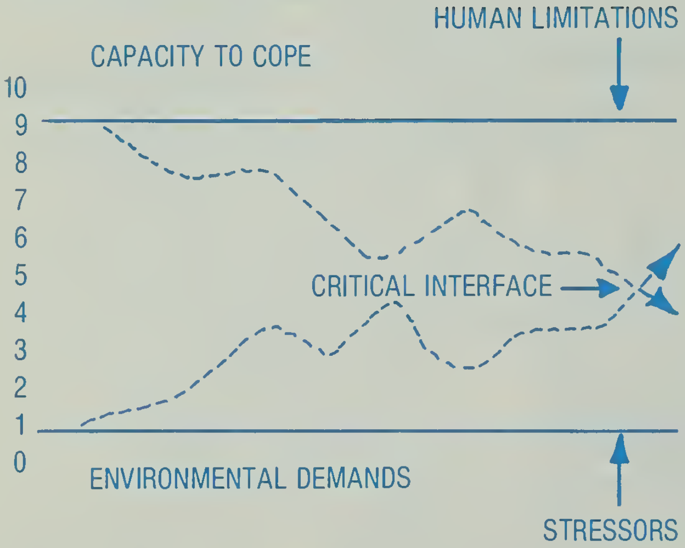

MISHAP PROFILE [ATYPICAL]

The top line in the graph above represents a person's capacity to cope with the demands of the environment at a given point in time. The bottom line represents environmental demands placed on him. The scale to the left is to show that the capacity to cope and the demands placed on us vary with time. This capacity will increase or decrease based on different individuals in different situations or the same individual under varying circumstances. The key to this model is that as long as these two lines are separated we won't have a mishap; if the two lines come together a mishap will probably occur because the demands of the environment exceed the person's capacity to cope. Let's consider two extreme cases in this mode. The first one being when the capacity to cope suddenly drops to zero, as in the case of someone driving a car, or airplane and they suffer a massive heart attack. That is totally incapacitating. Even with very low environmental demands this driver or pilot will not be able to cope. The lines cross and we have a mishap. In aviation mishaps, this is very rare and accounts for less than 1% of our Class A mishaps. If you consider spatial disorientation as a sudden reduction in capacity to cope; we're talking about 7 to 8%.

The other extreme is when the environmental demands become so great that one can't cope with them; e.g., when a single-engine plane takes off and the engine disintegrates. I don't care how good the pilot is, a mishap will occur. This accounts for 15 to 20% of our Class A's.

The typical mishap is better represented by the following version of the first model and there are some obvious differences between the two.

MISHAP PROFILE (TYPICAL)



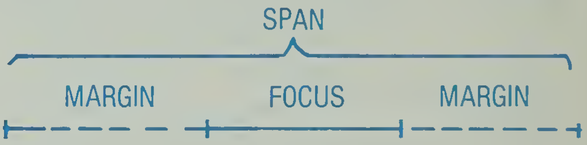
Notice that the "capacity to cope" line starts out somewhere down the scale. This is to say that because of individual deficiencies we are never operating at a theoretical peak human efficiency. That perfect human being probably doesn't exist, so we start out somewhere down the scale of performance capability. The lower line starts somewhere up the scale since there is always some demand on us from the environment, however subtle. The main difference in this version is that rather than sudden changes in the interface between man and his environment, the changes that result in mishaps are subtle and insidious. Where the two lines approach each other we have a near mishap and we've all had a close call at one time or another. In terms of this model, our capacity to cope was just sufficient to meet the demands of the situation. Occasionally, about three times in every 100,000 flying hours, the combination of human frailities and environmental demands are incompatible. When the two lines touch a critical interface occurs and we have a mishap.

Span of attention refers to both the amount and duration of conscious attention we are *capable* of investing. This varies from person to person and increases from childhood to adulthood and then decreases in old age.

The focus of attention is that portion of our span of attention we are actually using. What remains is then referred to as the margin of attention.

INVESTMENT LEVELS OF CONSCIOUS ATTENTION

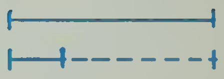
SPAN OF ATTENTION — AMOUNT AND DURATION
FOCUS OF ATTENTION — ACTIVELY DIRECTED
MARGIN OF ATTENTION — RESERVE AVAILABLE



While investigating aircraft mishaps, I found the following attention deficiencies significant. They are shown here in the order of greatest frequency. We will briefly look at each of these in terms of where the deficiency in attending lies. We will also present some factors which make the deficiency more likely to occur.

CHANNELIZED ATTENTION

CONSCIOUS FOCUS REQUIRED
CONSCIOUS FOCUS AFFORDED

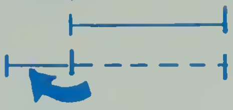


CATALYSTS:

- FATIGUE
- LACK OF KNOWLEDGE
- CONTINGENCY SITUATION
- EXCESSIVE MOTIVATION
- DRUGS (CNS DEPRESSANTS)

Channelized attention. This is the focusing of conscious attention on a limited number of environmental cues to the exclusion of others of a higher or more immediate priority. Target fixation is a good example: a pilot is so intent upon keeping his sights lined up on a target that he runs into it. Ask any fighter pilot at an exercise such as RED FLAG what his ambition is and many will respond that they want to get an F-15 in their gunsights. It's happened more than once that a dissimilar aircraft, like an F-4, flew himself into a position where recovery was impossible. He channelized his attention on one task to the exclusion of tasks of a higher or more immediate priority, like flying the aircraft safely.

DISTRACTION (INTERNAL AND EXTERNAL)



CONSCIOUS FOCUS REQUIRED
CONSCIOUS FOCUS AFFORDED

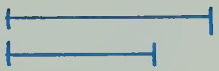
CATALYSTS:

- THREATENING ENVIRONMENT
- UNDERMOTIVATION
- PSYCHOSOCIAL STRESSORS
- INEXPERIENCE

Distraction. This is the interruption of conscious attention to a task by the introduction of a non task related environmental cue or mental process. If our attention is drawn away by a bright light or loud noise then it is external distraction; if our attention is drawn away by thinking about family problems or check rides, it is then called internal distraction.

There are times when we want our operators of weapons systems to be distracted such as when the system malfunctions and needs to be attended to. Examples of some cues which may be received are, a red warning light or an explosion. But each operator must be trained well enough to make an instant decision as to which task is the more important at the time. An experienced person knows what the important cues are and is prepared to resist distraction.

TASK SATURATION



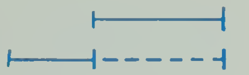
CONSCIOUS FOCUS REQUIRED
CONSCIOUS FOCUS AVAILABLE

CATALYSTS:

- FATIGUE
- POOR SYSTEM DESIGN
- LACK OF EXPERIENCE
- EMERGENCY CONDITION
- DRUGS
- OVERDEMANDING TASK

Task Saturation. This occurs when there's too much to attend to at any one time and significant cues are missed. The task demands more of the operator's attention than he is capable of giving. One example is poor system design; not only the weapon system layout but also the tactics and procedures we use. We may have a pilot egressing from a low level bombing pass, running a checklist, changing radio frequencies, copying a clearance and trying to fly the airplane all at the same time. Throw even a minor emergency in and he has a lot to think about in a compressed time period. The experienced pilot ignores the low priority tasks and attends to the high priority tasks. But it is the experienced pilots who design the tactics and procedures and we may be building traps for the less experienced. The same can be said of cockpit design.

INATTENTION



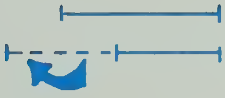
CONSCIOUS FOCUS REQUIRED
CONSCIOUS FOCUS AFFORDED

CATALYSTS:

- UNCHALLENGING TASK
- UNDERMOTIVATION
- PSYCHOSOCIAL STRESSORS
- DRUGS

Inattention. This differs from distraction in that the appropriate level of attention never was given to the task at hand in the first place; i.e., the operator relegates to the preconscious what he should attend to at the conscious level. We see it in mishaps all the time and if the person survives, whether operating heavy equipment or driving a POV, or flying an airplane, you still get similar statements like "I didn't see him," "I didn't notice," or "I was thinking of something else." Not paying attention is a technically accurate description of this anomaly since we must invest our conscious attention into what we are doing.

HABITUATION



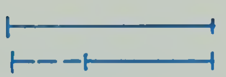
CONSCIOUS FOCUS REQUIRED
CONSCIOUS FOCUS AFFORDED

CATALYSTS:

- HIGH WORKLOAD ENVIRONMENT
- POOR DESIGN
- LACK OF EXPERIENCE
- LACK OF KNOWLEDGE

Habituation — This is the adaptation and subsequent inattention to a cue after prolonged exposure to it and it occurs in all of us naturally. A good example is the pilot on final who is instructed by the tower to go around because his gear isn't down. He proceeds to land anyway, gear up. After the very short landing roll tower asks him why he landed after being sent around. The pilot responds, "I couldn't hear you because my gear warning horn was so loud."

NEGATIVE TRANSFER



CONSCIOUS FOCUS REQUIRED
CONSCIOUS FOCUS AFFORDED

CATALYSTS:

- HIGH EXPERIENCE
- HIGH WORKLOAD
- NEW ENVIRONMENT
- CRISIS SITUATION

Negative transfer. This is also known as habit pattern interference and occurs when some response is so well learned that it can be performed at the preconscious level in the learning situation. For example, you drive a car with a manual transmission and you've always driven a car with a manual transmission. Someday you may be in a hurry to get somewhere and your car won't start. You borrow your buddy's car with an automatic transmission but now you're really running late. You jump in, put the key in the ignition and proceed to drive your left foot into the firewall. A more relevant, true example is about an F-4 pilot stationed on the east coast. He does all of his air to air combat training over the Atlantic Ocean. Flying over the ocean, the altitude read on the altimeter, if it's properly set, is the same as distance above the surface. That's not necessarily true flying over land. Now this pilot goes to RED FLAG and finds himself maneuvering to get an F-15 in his gunsight. As often happens when an F-4 takes on an F-15, the F-4 is now in the F-15's sights. The F-4 pilot decides a split-S maneuver will extricate him from this undesirable position. He glances at his altimeter, and sees 10,000 feet, plenty of altitude for a split-S. He then proceeds to split-S his aircraft into the 5,000 foot high terrain below. Ironically, a highly experienced person is more apt to experience negative transfer than an inexperienced one, especially when he's changing from one weapons system to another. High workload or a crisis situation also make negative transfer more likely.

We have given a brief rundown on some of the anomalies of attention you may have to deal with. A quick look at some of the factors which can precipitate or sustain the anomalies of attention are:

SUMMARY OF CATALYSTS

INEXPERIENCE — HIGH EXPERIENCE
LACK OF KNOWLEDGE — HIGH KNOWLEDGE
UNDERMOTIVATION — EXCESSIVE MOTIVATION
LOW WORKLOAD — HIGH WORKLOAD
UNTHREATENING ENVIRONMENT — THREATENING ENVIRONMENT

- FATIGUE
- DRUGS
- PSYCHOSOCIAL STRESSORS
- POOR DESIGN
- LACK OF AWARENESS OF ONE'S LIMITATIONS/FAILURE MODES

In the first five items, there seems to be no ground on which we are safe from some kind of attention deficiency, although there are different attention failures associated with each of the extremes. There is no one fix we can implement to prevent our pilots, armament handlers, missile crews, maintenance types, or any other Air Force personnel from falling prey to one or more of these deficiencies in all situations.

The next four factors already have ongoing programs designed to detect and counter them although they probably weren't initiated to rectify anomalies of attention. I added the last one because I didn't mention it before and because it contributes to the conditions which increase the likelihood of all the attention failures we're discussing.

What remedial action should be taken?

Remedial measures should be aimed at preparing the individual to avoid attention deficiencies and to reduce those factors that make attention failures more likely.

Supervisors should anticipate the types of attention problems that are most likely when they match a given person with a certain mission. This means managing and guiding his people with an insight to their unique strengths and weaknesses, level of motivation and experience level.

Supervision, however, isn't the only answer nor is it the most important. The kind of training our people receive and how that training is administered is also important. Thorough knowledge of the job is required, but our people also need to be intimately familiar with how to handle the conditions under which they are most likely to perform. Training that simulates the different conditions we can expect in real world operations would be beneficial if our people are equally prepared to deal with low workload situations as well as high workload situations, low stress environments as well as high stress environments, boring tasks as well as challenging tasks. Being trained to cope with various environments, I think, will assist in reducing attention anomalies that are incompatible with safety and thus with mission completion.

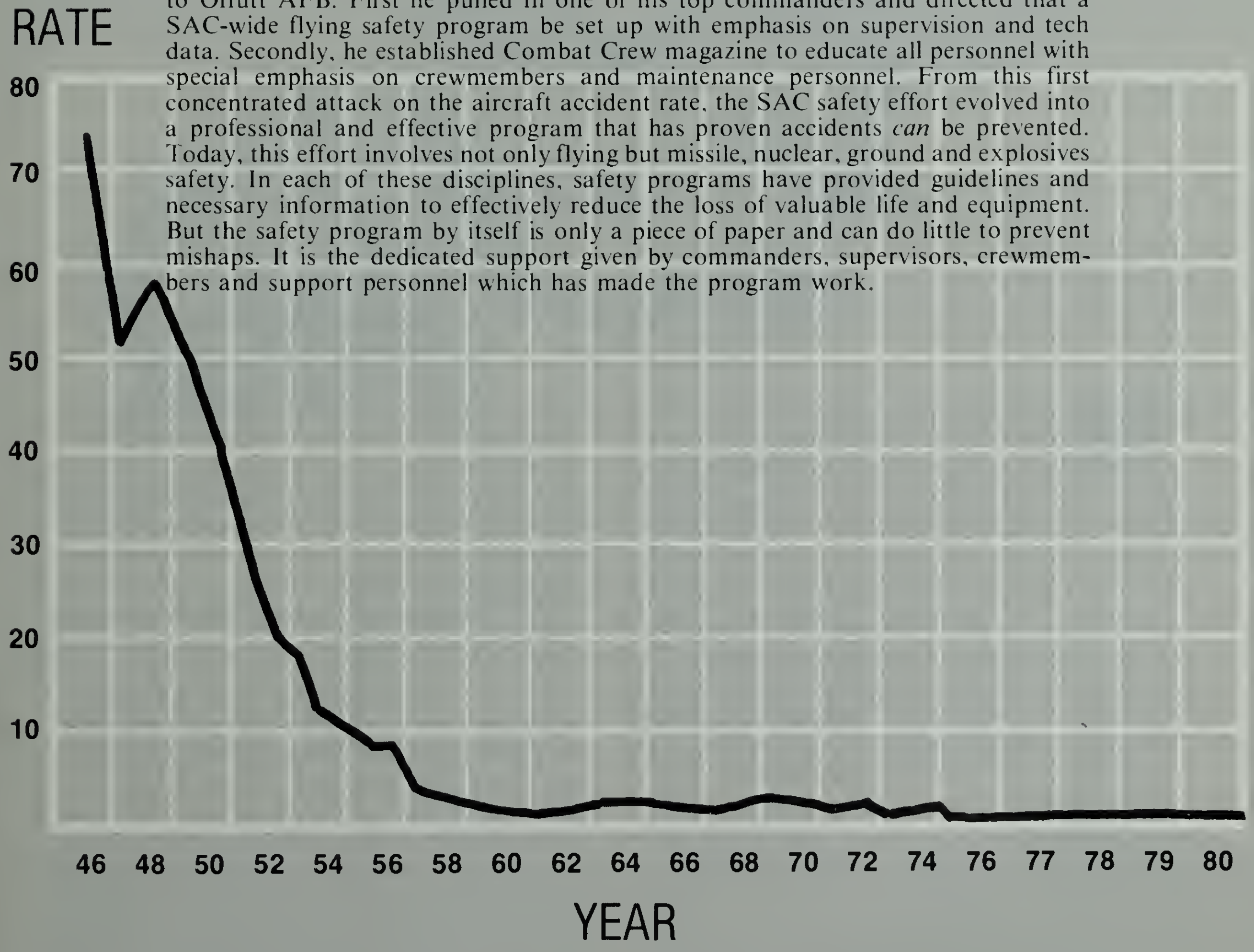
From the other side of the coin, we can do much to control the stress levels in our people's environment. Designers of weapon systems and the tactics and procedures to employ them should jointly consider the various workload levels in the different phases of its operation. We must avoid whenever possible putting people into a time compressed high workload situation.

Finally, the single most effective countermeasure against attention deficiencies is the individual's awareness of his limitations. More important than supervisors knowing their people, people must know themselves. Ultimately, the individual is in the best position to determine when one or more of the attention anomalies discussed begin to affect his performance. We train our people to know the limits of their equipment; I suggest we also train them to know their own limits.

SAC MAJOR AIRCRAFT ACCIDENT HISTORY

Throughout the 35 years of its history, SAC has had to overcome many problems. Not the least of these problems was an unacceptably high aircraft accident rate that accompanied the buildup of our strategic air arm. SAC's mishap experience during its formative years rapidly drained away irreplaceable manpower and weapon systems and stood at a high of 75.48 per 100,000 flying hours in 1946.

Gen Curtis E. LeMay set out to correct this situation shortly after SAC moved to Offutt AFB. First he pulled in one of his top commanders and directed that a SAC-wide flying safety program be set up with emphasis on supervision and tech data. Secondly, he established Combat Crew magazine to educate all personnel with special emphasis on crewmembers and maintenance personnel. From this first concentrated attack on the aircraft accident rate, the SAC safety effort evolved into a professional and effective program that has proven accidents *can* be prevented. Today, this effort involves not only flying but missile, nuclear, ground and explosives safety. In each of these disciplines, safety programs have provided guidelines and necessary information to effectively reduce the loss of valuable life and equipment. But the safety program by itself is only a piece of paper and can do little to prevent mishaps. It is the dedicated support given by commanders, supervisors, crewmembers and support personnel which has made the program work.



Putting the Fun Back Into Flying

Capt Stephen C. Johnson
Pease AFB

Honest, no one knew where the old guy came from. Our best guess placed him as a Camp Carson Survival School graduate or at least a graduate of a recent pre 60-9 conference. W. C. Scratchlow was one of those 0-5 drifters. He'd always been a lieutenant colonel, had been to every base (just before it closed), had flown everything, and had occupied just about every crew position there ever was. Spry for his countless years, he was still dapper in a rumpled fashion, although his eyeglass frames were 40 years out of date. The old gent was our temporary deputy to the assistant ops officer, and each day he'd move his B-4 bag and customized name plate from desk to desk, since we didn't have enough office furniture to go around for all the staff. I guess he was the type of person you just wondered about or felt kind of sorry for but you would never think you could learn anything from him.

I got my chance to find out for sure one day when I saw my crew might be flying with him for an air refueling and local mission which at our station lasts about 1.9 hours and has plenty of built-in time compression. I chuckled under my breath as I set the schedule on the mission planning table. I knew the old codger would be hard pressed getting his dentures in place before the airplane was back in the chocks again. So I decided to tag along in case he might need my help.

My first surprise came when I saw the colonel at the mission planning table a half an hour early completing most of the paperwork. I always thought when staff fly with crewmembers you're lucky if they show, let alone early. But this guy was obviously organized. It seemed like a flash and the forms were completed leaving most of the day for the briefing. Well I shouldn't say briefing because what transpired wasn't a "briefing" the way I would've handled it. First of all, the old boy outlined the flight in detail from preflight to touchdown. Not only did he discuss all planned actions, most of which I like to brief as we go along in flight, but activity compression points, contingencies that could affect the mission, and ways to simplify crew coordination.

Then he did something really different. "Since there weren't any comments or questions during the briefing," he said, "I will assume there's no disagreement. So why don't we go back to the beginning and see if there's anything we can do differently." I could see my guys blinking their eyes as the wheels began to grind in their heads. Each of them offered opinions, and good ones too, considering they didn't come from the AC first. The nav said he'd like to announce the climb EPR if the co didn't have time for the arithmetic, since he wasn't too busy to look it up exactly and make the bleed corrections. The boomer, of all people, noticed that end AR and the initial approach fix were only five minutes apart and suggested we take an extra turn in the anchor to clean up the checklists. It was good the crew was taking such an interest, I guess, since we'd be burning up $9500 worth of fuel just for our own training. But more than that, I could see the responsibility for establishing goals and appraising progress shift from the left seater's shoulders to those of the other crewmembers. It was beginning to look like the end of my one man rule. I was beginning to feel sick.

The next morning when we reported for the bus, the old colonel was waiting for us with a box of fresh chocolate frosted crullers. Nice gesture but not something I would've done. But I'll admit it did kind of set the tone for the mission. Down at base ops, Col Scratchlow established a relaxed atmosphere and spent only that time necessary to accomplish the essentials and the crew was on its way to the aircraft, if anything a bit early.

Preflight and start engines were normal, but at the hammerhead Einstein, my copilot, was badly mired in recalculating takeoff data for the wind change. From the jump seat I was about to yell when an arthritic old hand covered my mouth and a voice said over interphone, "Take your time, co." Not my philosophy at all. I like to pressure him into getting it done and if he can't I take it away from him. When that happens, you ought to see his eyeballs counter-rotate and his chin twitch. Oh, by the way, Col Scratchlow finished the job by giving the little blighter the takeoff in gusty wind conditions.

Well, far from what I thought would happen, the flight turned out to be great. Noticeably there was none of the usual interphone chatter that accompanies my presence. Most of the communications were handled either cross-cockpit, or with notes. Oh! I almost forgot to mention the crew even came down smiling a little. Now, that was a first.

A couple of other things I caught — all checklists were initiated as soon as possible prior to but not during activity points, and all individual activity ceased when the airplane was in an out-of-trim condition, that is, during turns and level-offs. Like I said, interphone was held to a minimum and the co was briefed well in advance what clearances would be required. When both receivers requested an additional offload, the old vet carried the analysis of the situation to its logical end without arriving at any early conclusions. Gathering inputs from the entire crew, he selected the nav's option as the best. He was not reactive or punitive against other ideas.

I once read some FAA figures that reveal flyers with between one and three thousand hours have more accidents than any other group. That's us, I hate to say. Seems the problem in most cases is increased familiarity with a particular pattern of events that leads to mind set. And if you get used to being a tyrant like I have on occasion, that can be all too dangerous.

So, what was it about this old geezer? His coordination was smooth as silk, and he worked to get the most out of his crew to generate a cheerful response. He did three things that made for a happier and safer crew. First, he was disciplined enough to plan thoroughly so that when changes came up, he didn't fumble for the freeze button. A crew that can anticipate each event and react with finesse naturally enjoys doing the job. Second, he encouraged participation, even if it meant disagreement — he knew he didn't always have the best idea. Finally, he was quiet and confident enough in his own abilities to let his fellow crewmembers handle their own responsibilities without harrassment; the cockpit is no place for folks who export their own stress to others.

I wonder now how many totalitarians in all crew positions would benefit from a ride or two like this, observing how other people operate. In light of ongoing reductions in flying time, perhaps it ought to be a regular event — at least for guys like me.

Now, about the colonel. He shuffled off about a year ago on a permissive TDY down south. And frankly, we haven't seen him since. So if any of you happen to run into a white-haired old 0-5 whose glasses are 40 years out of date, let this author know so we can forward his EWO gear, customized name plate, bottle of plastic cleaner and roll of Form 1's. Thank you.

HOW MANY EYES ARE IN TAXI?

Major Norm Hythecker
Central Flight Instructor Course
Carswell AFB, TX 76127

"Carswell tower this is Fuzzy 92 taxi, takeoff, IFR Carswell." "Roger, Fuzzy 92, taxi to runway 35. The winds are 350 degrees at 10 knots, the altimeter is 3005."

How many times have we heard this familiar phrase in our flying career? A no sweat operation, right? But how often have we seen or heard of a taxi operation that hasn't gone as smoothly as we might have really liked? We did everything by the numbers, so where did we go wrong?

Taxiing the KC-135, the B-52, or any other airplane is probably one of the first maneuvers pilots learn to perform. Unfortunately many of us have had to learn this maneuver the hard way. Taxi incidents and traffic jams are still occurring regularly and we as instructors can certainly help to reduce or eliminate them with good airmanship-thinking, planning, and acting with a purpose.

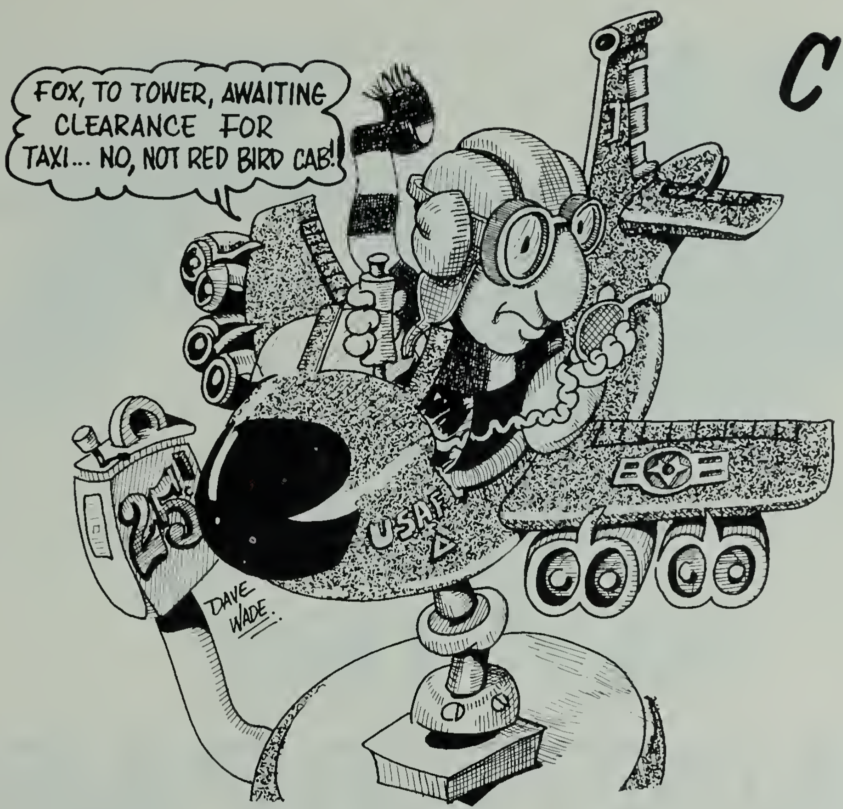
To start with, taxiing begins before your engine start. Seat position is obviously important. You don't want to be too low in the seat or too far from the pedals. Make sure you can see over the nose and get full rudder travel. Then, before you start engines, make sure your receiver/tanker is in the green. Fuel is just too precious to be wasted waiting for a broken mate. You might also try to accomplish some of the obvious items on the taxi check while you're stopped or in the chocks. Why not brief your takeoff procedures, emergency considerations, get your ATC clearance, takeoff weather, etc. Get these items out of the way so you can concentrate on the aircraft's movement.

We're ready to taxi. What are some of our planning factors? Before we ever move let's check to see who else is out there on the taxiways. How often have you seen someone taxi out of sequence or hold up an important launch? Listen to the radios! Look at the 60-9! Find out if it's "your turn" to enter the taxi stream. Remember, the tower doesn't always know who should taxi first in a cell or even if Buff 11 is supposed to takeoff before Buff 12. We're ready to add power, right? Standby. Are the passengers and extra crewmembers ready to move? Are the hydraulic systems still working properly? Are we clear of ground equipment? Do we have a good taxi reference point? There are lots of things to consider, right? How much power do we need? A light weight tanker or bomber will move quite nicely on 75-80%, but a heavy weight aircraft might require 85-90% or more. A good technique to use is to slowly and smoothly add your power until you detect movement and then stop your throttles there to continue your taxi. Test your brakes lightly and *squeeze* your steering wheel left and right while you're at a slow speed to keep from knocking someone on their keister.

Now that we're moving, what else should we consider? We must remember that thrust from a J-57 can approach 100 mph at 100 feet, and that type of breeze can blow over a Dash 60 power cart or guard shack with no problem. Maintaining the center line is fairly easy if we squeeze our steering wheel rather than jerk it, and imagine, if you will, our right heel as riding on or scraping the centerline. Keep your eyes moving *outside* — both close to the aircraft and at a distance. Defensive driving is not just for autos. Watch the taxi lines too, especially when taxiing at a strange field. Remember, there is no guarantee that taxi lines will provide *you* with adequate wingtip clearances at every base you operate from. I remember one time having to call C.E. to come out and saw down two trees so I could taxi into a dispersal base ramp. Thank goodness it was daylight when I arrived or I might have been in trouble. At night I might not have adequately perceived the seriousness of the problem. And that brings up another area — taxi speed.

Do you realize that many people taxi at night at a faster speed than they do in the daytime? Speed and distance are much more difficult to accurately judge at night, so if you have to guess, guess conservatively

CFIC Corner


FOX, TO TOWER, AWAITING CLEARANCE FOR TAXI... NO, NOT RED BIRD CAB!
25¢
USAF
DAVE WADE.

slow down and leave a little extra space. Watch your speed in cornering too. A 300,000 lb tanker or a 450,000 lb Buff can really tear-up a gear assembly or a set of tires in a high speed turn.

Keep aware of your position *at all times!* Never allow yourself to get distracted by something or someone inside the cockpit while the aircraft is moving. If you need to divert your attention between inside and outside — it's probably time to stop taxiing and then continue taxiing when you can give 100% of your concentration to the task at hand.

Also, watch where you stop and what you do when you are stopped. I don't know how many times as SOF I've sweated out getting stuck while driving off the hard surface to give an aircraft his last chance when he could have stopped at a wide spot in the taxi way or on the hammer head. Also, try to avoid stopping behind the ILS antenna zone so the signal will not be disrupted. And of course we should never block the alert high speed taxiway.

Do any of these items sound familiar? I'm sure we've all been guilty of some or all of them at one time or another.

After landing from a tiring flight, we still have to taxi before the mission is complete. This is a bad time to ruin an otherwise good flight. Again watch your speed. Remember if you've been practicing approaches or touch and go landings your speed reference may be skewed and you may find yourself at too high a speed to effectively maneuver the airplane.

As you clear the runway, be considerate of others behind you. Don't blow your drag chute back onto the runway or leave it in the first fifty feet of the taxi way — someone else may want to use the taxi way too, and transient maintenance may not be able to get that chute right away. Also remember that jet blast again. An aircraft in the landing flare can be significantly affected by 50 to 100 knots of direct crosswind caused by an aircraft running up engines for taxi or oil scavenge.

Be aware of your aircraft fuel distribution and C.G. Tankers with an excessive aft C.G. should consider installing the tail stand· before engine shutdown. Bombers, before you taxi over those fuel pits maybe you'll need to crossfeed to get some weight off the tip gear. Watch the engines you shutdown, too. Consider first any equipment you may lose — generators, alternators, bleed air, hydraulic packs. Insure you won't have a critical loss that will leave you in the dark or incapacitated. Factors such as taxi way surface conditions and taxiway width may also influence your decisions.

Obviously there are many factors to consider when discussing taxi operations. I have attempted to touch on a few of them, but remember the bottom line — common sense. All flight and taxi operations require you to use that block of gray matter sitting on your shoulders. Too often we allow ourselves to be rushed, or follow fools to destruction. Don't let yourself or your students become foolish. Keep your head and *fly the airplane* until all the engines are shut down and you're safely back in the chocks.

An Overview of Long-Range Aviation (Dal'naya Aviatsiya):

MEET YOUR SOVIET COUNTERPART

STANLEY H. EDDLEMAN, Capt, USAF
2nd Bomb Squadron
March AFB, CA 92518

This article's purpose is to familiarize the reader with Strategic Air Command's (SAC) counterpart in the USSR. A direct comparison between SAC and Long-Range Aviation is not possible in so far as the latter does not control the Strategic Rocket Forces of the Soviet Union. Strategic Rocket Forces is a separate arm of service in the Soviet Union and although considered the most important service of their armed forces, it will not be pursued in this analysis of Long-Range Aviation.

The Long-Range Aviation force consists of three air components of which two are deployed in European Russia and one in the East. It is a subordinate command of the Soviet Air Force but does have a somewhat considerable measure of operational independence. Long-Range Aviation's headquarters has a central staff with sections covering operations, intelligence, organization and mobilization, administration and maintenance, personnel, flight services, meteorological services, communications, and training. It is probable that this headquarters carries out strategic planning through coordination with the headquarters of the Strategic Rocket Forces and Navy.

The primary mission of Long-Range Aviation is to remain prepared to fly intercontinental and peripheral strike operations. Their responsibilities also encompass roles in long-range reconnaissance, striking naval targets, and supporting conventional forces. Soviet planning focuses on using this strategic bomber force to perform follow-on missions after initial surface-to-surface ballistic missile strikes and as supplementary weapons for a retalitory strike. These missions would probably include armed reconnaissance, selective hard targeting, striking populated areas, and bomb damage assessment.

The strength in aircraft has remained comparatively constant in recent years and until the entry of the Tupolev "Backfire" strategic bomber in 1974, the older "Bears" (1955) and "Badgers" (1954) with a few "Bisons" (1955) formed the major strategic bombing capability and are still very much in service. For medium-range missions the "Badgers" are augmented by the Tupolev TU-22 "Blinder" (1960) with supersonic dash capability.

The total strength of today's force is about 900 aircraft, composed of 100 TU-95 "Bears," (50 M-4

Bisons) 450 TU-16 "Badgers," 120 TU-22 "Blinders," and about 80 of the supersonic "Backfires." Approximately 40 MYA-4 "Bison" aircraft operate in the tanker role and occasionally "Bears" are employed in inflight refueling by transferring fuel from one bomber to another. The tankers serve both long-range bomber aircraft and the reconnaissance aircraft of Naval Aviation.

The latest addition to the Soviet long-range fleet, TU-122 "Backfire" epitomizes the Soviet determination to maintain the triad of strategic nuclear delivery systems, that is, silo-launched missiles, submarine-launched missiles, and manned aircraft. This concept should sound familiar to most individuals as this has been the United States' deterrent posture since the late 1950s. It was to be expected that the USSR would pursue a similar division of forces.

The "Backfire" caused quite a controversy in the recent negotiations of SALT II, and with good cause. It has an unrefueled range of approximately 5,500 nautical miles. This type of capability would allow the "Backfire" to strike targets throughout the United States from bases in northern Russia and Siberia. The performance characteristics of this aircraft obviously are controversial as to its precise operational role whether it be strategic or tactical interdiction.

The long-range air units of the Soviet military are developed throughout the Soviet Union, with many staging bases in the Arctic region (northern tier assignments) and the Leningrad Military District. From these locations, they carry out their missions of armed reconnaissance in the Atlantic in peacetime, and of reconnaissance, attack, and maritime operations against the United States and Europe in the event of war.

Although this has not been a complete evaluation of SAC's counterpart in the Soviet Union, it does present a general framework of the organizational and operational role Long-Range Aviation plays in the Soviet Air Force. One can be assured that the Soviets will continue to modernize their strategic aerospace forces as they further project their military might. Should they choose to exhibit this power to the fullest, one will know that they have but *one* goal:

> *"War must not simply (be) the defeat of the enemy, it must be his destruction. This condition has become the basis of Soviet Military strategy."*
>
> *V.I. Lenin and Soviet*
> *Military Strategy*

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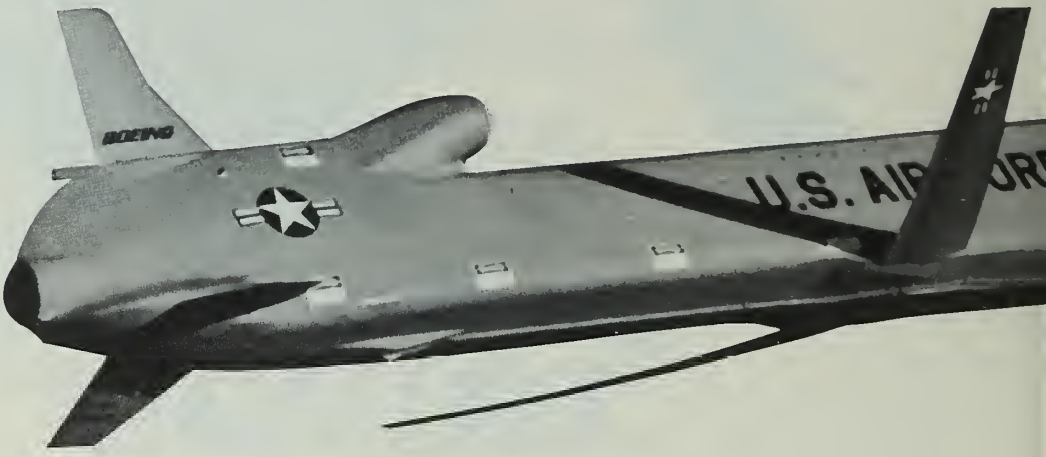
Air Launched Cruise



Captain Marc C. Turner
HQSAC/XPHC

The 1970s were an absolutely critical decade requiring defense appropriations. SAC has been continually asked to modify rather than replace its assets. This is most evident on the bomber leg of the TRIAD; however, Soviet defensive missile development, coupled with a new air defense system may signal an end to the use of the B-52 as a system capable of penetrating Soviet air space in the late 1980s.

With the cancellation of the B-1 in the summer of 1977, even greater emphasis was placed on the B-52 and its newest weapon, the Air Launched Cruise Missile (ALCM). The ALCM is not now, nor was the B-1, considered a panacea for our problems, but it is a giant step in the right direction.

The ALCM is not a replacement for, but is rather an adjunct to, the manned penetrator. The ALCM will provide increased bomber employment flexibility and present a highly proliferated low-altitude threat for the enemy defenses to engage. The ALCM is designed to be effective across the entire spectrum of strategic targets.

The Air Force initiated the ALCM program under guidelines provided by the Office of Secretary of Defense in a July 1973 memorandum. Much of the technology evolved from efforts to build a replacement for the ADM-20 "Quail" decoy missile. Although the decoy program was terminated, the basic air launched missile technologies were kept alive.

The ALCM is a subsonic, winged, turbofan-powered air-to-surface missile capable of flying low altitude terrain following missions with a long range and high degree of accuracy. The Boeing AGM-86B is 20 feet 9 inches long, has a 12 foot wing span and weighs 3100 pounds when fully fueled with JP-9. The missile is trapezoidal in shape with a top aft mounted engine air inlet. The wings, engine inlet, rudder and elevons are ballistically actuated at launch.

The air vehicle configuration has been designed specifically for B-52 carriage. The unique cross section shape maximizes useful area per unit length and minimizes the diameter of the internal launcher which minimizes modification to the B-52 weapons bay.

The air vehicle uses aluminum castings to lower fabrication costs. Castings constitute 80 percent of the airframe by weight. These castings add 80 pounds to the air vehicle weight but reduce unit cost by one-third. All primary fuselage elements are cast.

The enroute and terminal accuracies are obtained by an inertial navigation system which is periodically updated by terrain contour mapping (TERCOM) fixes. TERCOM fixing is accomplished by using a downward looking radar altimeter to measure the altitude variations of the terrain over which the ALCM is flying. The onboard computer then compares the measured terrain variations to prestored digitized data. Once a correlation or fix is made, the inertial velocities are updated and the missile track and time of arrival are corrected.

Missile

r&d corner

The cruise missile will be employed on the B-52G in accordance with the SAC 12-20 Plan. This plan is two-phased which directs ALCM external carriage initially and then in the mid CY 86 timeframe the B-52s will be retrofitted to allow internal carriage. Air Force direction regarding ALCM employment currently applies only to the B-52G. The SAC plan equips each B-52G with 12 ALCMs on two external pylons. Once the last aircraft has been equipped with twelve missiles, each aircraft will then be modified to allow carriage of an additional eight missiles internally on a new rotary launcher.

The first phase of the "12-20" Plan is called the Shoot-and-Penetrate mode. Each B-52G will be loaded with 12 external missiles and a normal complement of SRAM and gravity weapons internally. The second phase is called "standoff" as the B-52G will be loaded with 20 cruise missiles and will then launch all weapons beyond the range of enemy radar detection.

Cruise missile loaded B-52Gs will be first deployed at Griffiss AFB. First Alert Capability (FAC), September 1981, is defined as the capability to place on alert, if so directed, one B-52G equipped with 12 external ALCM in addition to SRAM and gravity weapons. The Initial Operational Capability (IOC) will occur in December 1982. IOC is a squadron of B-52Gs each with 12 missiles plus the internal load. Additional B-52G wings will be activated approximately six months apart.

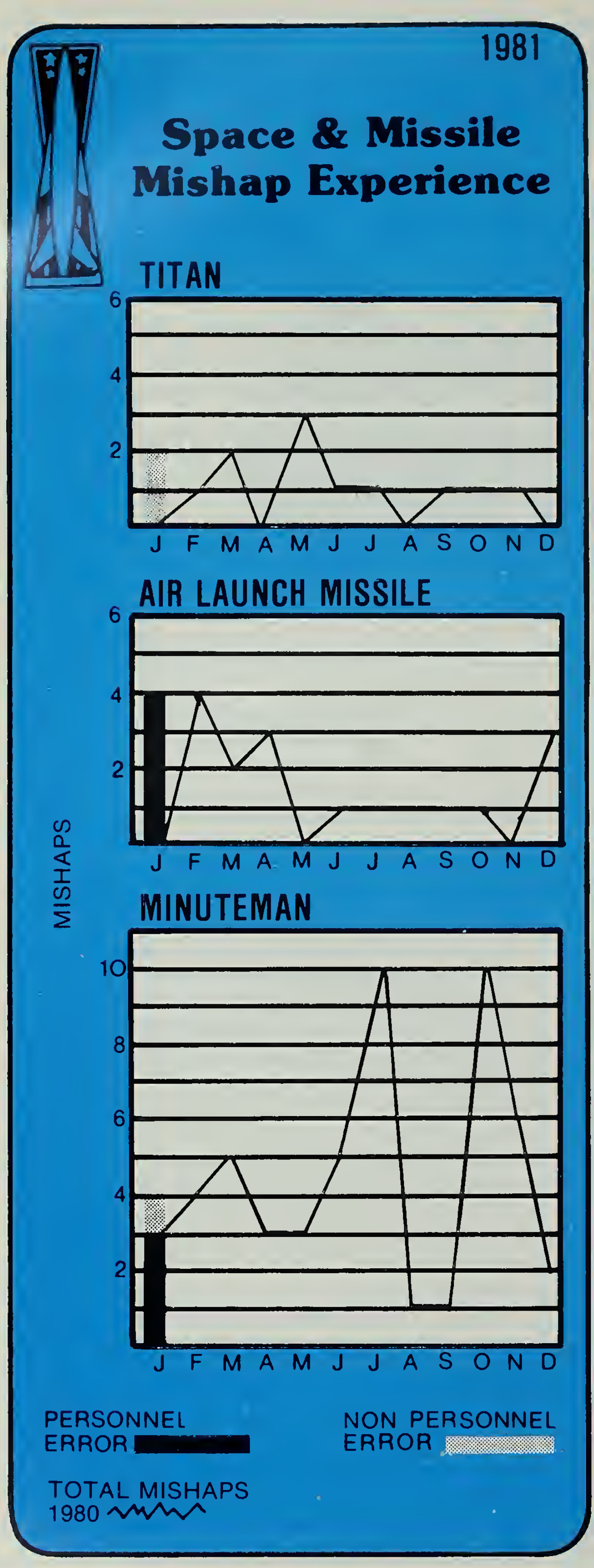
The advent of the ALCM requires a significant change in mission planning procedures. In the past, hundreds of aircraft missions were planned; now thousands of ALCM missions must be planned. Data automation will be an integral part of cruise missile planning.

New mission planning software and hardware has been designed to work within the framework of the existing SAC TRIAD Computer System (TRICOM): the Navigational Accuracy Module (NAM), the Clobber Analysis Module (CAM), and the Mission Data Preparation System (MDPS). NAM "overflies" the proposed ALCM's route, predicts the accuracy of the missile and computes the probability of map overflight. This data from the NAM is then passed to the CAM. The CAM assigns a probability of clobber, or generates a commanded flight altitude to achieve a specific clobber probability. This final output is a route that provides the highest probability of mission success. This route is then transferred to the MDPS via magnetic tape.

The MDPS is a minicomputer system located at each B-52G and H base. The MDPS verifies the mission data and converts it to a format that can be loaded through the B-52 OAS to the ALCM.

The MDPS will be located in the EWO vault area at each wing. A remote terminal, with access to the MDPS, will be located in the area of the Bomb-Nav Shop. Training mission segments (for example: low level routes and air refueling tracks) will also be loaded in the MDPS memory and the flight crew will be able to put these segments together to form a flight plan. The capability will also exist to create an entire OAS mission "from scratch" at the keyboard. The MDPS will also generate a fueled and winded flight plan, and other documents required by the crew.

The ALCM is currently undergoing a comprehensive test program designed to build the system performance data base necessary prior to operational employment. The ALCM/OAS weapon system will undergo final developmental testing in 1982. The weapon that we put on alert at Griffiss will be very thoroughly tested. A total of 39 ALCM launches are planned before December 1982 insuring that the final product meets or exceeds the requirements of the Air Force.



1981

Space & Missile Mishap Experience

Lessons Learned

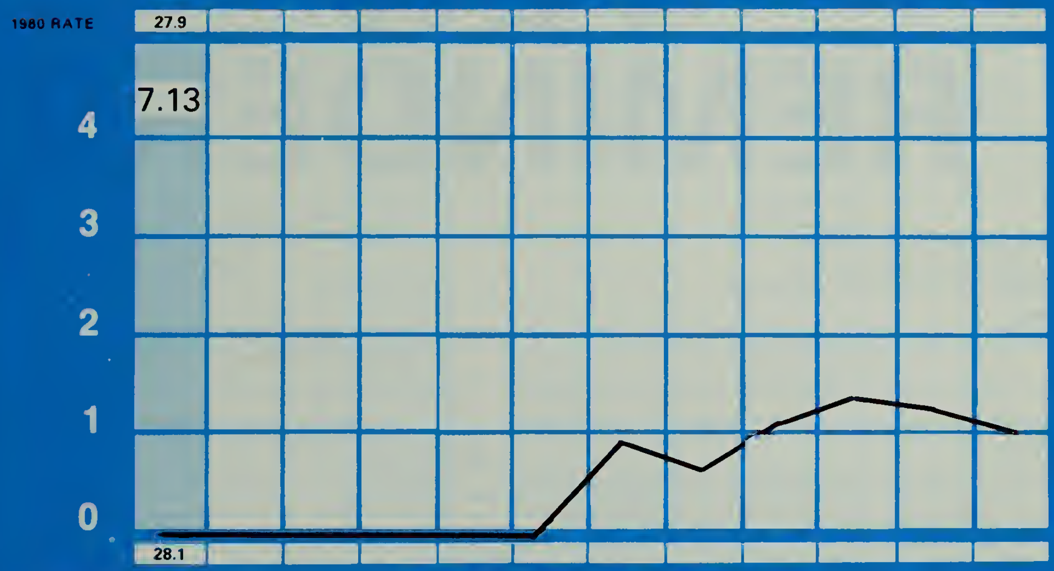
WHERE ARE THE SCRIBE MARKS? (SRAM) During a launcher upload operation the adapter required several adjustments by the load crew. Damage to the missile fin platform was discovered when the adapter was completely lowered. Probable cause was improper alignment of launcher trailer. This is one more mishap which emphasizes the extreme importance of proper alignment of trailers. Hopefully a T.O. change will aid us here.

UMBILICAL CONNECTION (SRAM) A maintenance supervisor discovered an umbilical receptacle connector had been broken off. The connector was found in the bay umbilical indicating the breakage had occurred during a download operation. Causes: Load crew failed to properly disengage pit pins for missile umbilical and did not fully unlock the umbilical before lowering the missile. Also tech data does not require inspection of the missile before the lead tape is placed over the connector.

STATOR SPARKS (TITAN) A diesel generator was being started up for testing after being removed, refurbished, and reinstalled by civilian contractor. The diesel had just obtained the correct RPMs for a no load test when the stator coil started to emit sparks. The missile engineer pressed the stop diesel pushbutton and the missile facility technician extinguished the fire. The stator coil had a hole burned in it but no other damage occurred. The stator coil had been bench checked prior to installation. Subsequent investigation revealed there is a potential for this type failure in remaining units. The insulation paper surrounding the phase coils is very brittle and susceptible to cracks when the diesel unit is moved.

1981 Flying Safety Rate

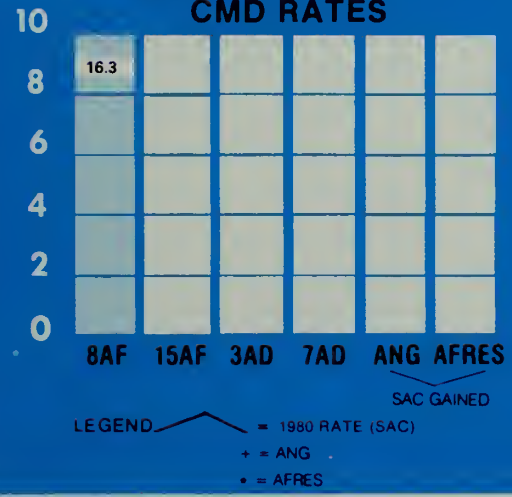
SAC CLASS A MISHAP RATE (PER 100,000 FLYING HRS)



CUMULATIVE FLYING TIME (1,000 HRS)

MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1980	0	0	0	0	0	0	2	0	1	1	0	0
1981	2											

1981 SUBORDINATE CMD RATES



MISHAP STATUS

KC-135 A	JAN '81
FB-111A	JAN '81

BIG
INSTRUMENT

A FEW REMINDERS

Captain James M. Sullivan
1st Combat Evaluation Group
Barksdale Air Force Base, Louisiana

There have been several revisions and deletions of familiar guidelines in our flying directives that have prompted some questions about accepted and expected operating practices.

There has been a noticeable trend toward "liberalizing" flight rules and re-emphasizing the prudent discretion of the pilot. A good example is the removal of the "2½ degree on-course" definition in AFM 51-37. The removal of specific parameters for various maneuvers usually doesn't affect the pilot who "grew up under the old system" and who attempts to fly within traditional and erstwhile published guidelines. On the other hand, many pilots are not familiar with (or have forgotten) some so-called "old head" guidance.

This is not to say that we always need specific, ironclad rules and regulations. Their absence merely requires us to sharpen our judgment, acknowledge our limitations, and to fly our aircraft like the pros we claim to be. As an old aviator's proverb says, "there are old pilots and bold pilots, but there are no old, bold pilots." So let's look at a few situations and the prudent way to handle them. These few reminders of some basics are actual questions from pilots who took the time to ask — some very prudent pilots.

ON COURSE

When being radar vectored to a final approach course, you are now expected to be established on a segment of a published route or Instrument Approach Procedure before descending below the last assigned altitude. The controller has certain responsibilities to position your aircraft conveniently so that you can intercept the route. But what is "established?" You compute and use normal lead points to turn onto the final approach course. If you should happen to roll out with the CDI deflected, when can you assume you are "established?" As a *guide,* we suggest that CDI "casebreak" using solid state ILS equipment will insure adequate obstacle clearance (See Combat Crew, February 1979). A prudent *guide* for TACAN/VOR operations might well be a CDI deflection of not more than one dot or 5 degrees. In either case, AFM 55-9 (TERPS) design criteria provide maximum obstacle clearance protection when the course centerline is maintained. The prudent professional knows that means CDI centered and always attempts to make that his standard.

WHERE DOES IT SAY . . . ?

Approach procedures are identified by the type of navigational aid(s) which provide final approach guidance. In figure 1, ILS and DME are specified. In addition, the final approach fix is identified by either radar or DME. Suppose the Carswell TACAN is NOTAMed out, and radar is not available. Would you plan to execute this approach? Where does it say you can or cannot? FAR Part 91.117 discusses inoperative/unusable approach components, and the FAA has asserted its position that since the controller and pilot cannot positively identify aircraft position, the controller will *not* issue clearance for the approach. Even though you may not have the FARs in the cockpit, the prudent pilot would request and plan an approach for which appropriate final approach navigational aids are available.

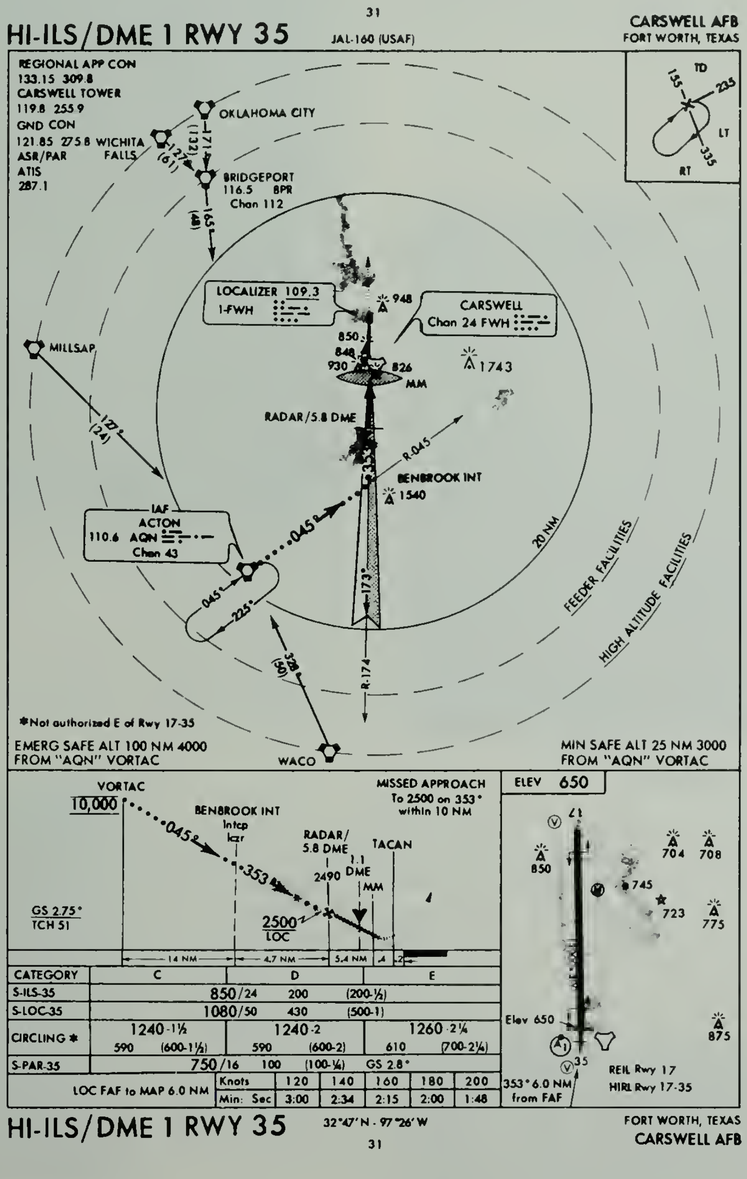
AIRWAYS

Remember when you routinely flew on airways in pilot training? We still have occasion to do it today. It's easy to maintain centerline, you say. But what about turns? Remember that "centerline navigation" means leading your turns at fixes along the route, particularly below 18,000 MSL. The reason is that there is a finite amount of airspace allocated to the airway width, and a turn at or after the fix may exceed airway or route boundaries.

LOST COMMUNICATIONS

Many pilots feel that too much has been written and is written about lost communications procedures. They are probably right! During the last year, the FLIP Enroute Supplement has deleted specific lost communication instructions for given situations such as turbo-jet enroute descents. Present guidelines are more general in nature, but can be applied almost universally by the pilot who prudently plans his options in advance. Briefly, "pilots are expected to exercise good judgment in whatever action they elect to take. Should the situation so dictate, they should not be reluctant to use the emergency actions contained in flying regulations."

These few examples may seem very basic to most of you, and they are. But sometimes those basics we relied on while learning our trade tend to elude us when we are faced with uncommon situations. While we increasingly define procedures and tactics for our various missions, a great deal of latitude remains when we apply our skills to basic flying. While the rules might seem to have disappeared or loosened, prudent judgment demands we **FLY THE AIRPLANE**.



CATEGORY	C	D	E
S-ILS-35	850/24 200 (200-½)		
S-LOC-35	1080/50 430 (500-1)		
CIRCLING *	1240-1½ 590 (600-1½)	1240-2 590 (600-2)	1260-2¼ 610 (700-2¼)
S-PAR-35	750/16 100 (100-¼) GS 2.8°		

LOC FAF to MAP 6.0 NM	Knots	120	140	160	180	200
	Min: Sec	3:00	2:34	2:15	2:00	1:48

PROFESSIONAL PERFORMERS

HEADS UP

Capt Thomas W. Phelps, an instructor pilot, 43d SW, flew as copilot with a nonintegral crew on a local B-52D training mission. They had returned to Andersen AFB to accomplish scheduled local transition training prior to the final landing. While turning onto final at 2300 feet MSL, Capt Phelps noted that excessive nose up trim was required, resulting in an unusually nose high attitude for a flaps down configuration. He scanned the cockpit and noted that the flaps had moved full up with the flap handle in the down position. He immediately directed the pilot to increase airspeed and not to increase pitch as this could place the aircraft into a stall while flying at the flaps down airspeed. The aircraft was approximately 1500 feet AGL when the go-around was initiated. The first attempt with the emergency extension system was unsuccessful. The other emergency system lowered the flaps at which time the flap control circuit breakers were pulled to prevent further flap movement. This removed power from the flap circuitry and the flaps remained full down. A normal full stop landing was made without further incident. Postflight inspection revealed a malfunction in the limit switches. This allowed an uncommanded flaps up signal to be sent to the flap drive motor.

Had Capt Phelps not recognized the unusual trim requirements, the nose high attitude, and taken decisive corrective action, a catastrophe could have been the end result. He clearly demonstrated superior airmanship and professionalism throughout this emergency.

MAINTENANCE AIRMAN

SrA Michael J. Simmons, 43 OMS, 43SW, Andersen AFB is SAC Maintenance Airman of the Month. Airman Simmons is a highly professional young man and possesses a tremendous amount of technical ability. He was assigned as a three-level technician to the OMS phase inspection team, immediately entered into training for the five-skill level and was upgraded in the minimum time period. He developed a self-learning program for himself to acquire the technical proficiency required to be the best phase inspector assigned. Airman Simmons has had a total of 18 evaluations all of which he passed with no errors. He received an outstanding rating during his last over-the-shoulder evaluation and volunteered to assist in the training of new personnel during a shortage of qualified instructors. SrA Simmons is a dedicated airman and a valuable asset to SAC and the United States Air Force.

SAFETY OFFICER

Maj Raymond D. Chuvala, 390SMW Chief of Safety, retired the end of January after serving 21 of his 24 years in the Strategic Air Command. He entered the Air Force in 1957 as an electronic countermeasures technician with the 99BMW at Westover AFB. In 1959, he was a member of the team testing the GAM-72 Quail missile at SAC's 4135BMW, Eglin AFB. He received a commission from OCS in 1960 and was reassigned to Westover as an avionics officer. In 1964, he joined the 381SMW as a crewmember with the ICBM force and served as instructor MCCC. In later years, he served as chief of operations plans for 1STRAD, was a student at Air Command and Staff College, chief, plans and intelligence division for the 91SMW, and after a tour in Greece, was assigned to Davis-Monthan's Titan II wing in September 1975. He became chief of safety on 1 May 1976. Maj Chuvala's contributions to the SAC safety program have been significant. Many of the programs developed at Davis-Monthan have been adopted by Air Force and SAC. Changes to Titan II propellant safety procedures and identification of breathing apparatus deficiencies were a direct result of his efforts.

Maj Chuvala has been a valuable asset to the Command's safety program and his efforts have directly contributed to over seven years of class A mishap free experience at Davis-Monthan.

TITAN CREW

Crew R-003, 308 SMW, is named Titan Crew of the Month. Members of the crew are: 1Lt Robert B. Hartzell, MCCC; 1Lt Thomas R. Spivey, DMCCC; Sgt Robert L. Brehm, MSAT; and A1C Alan L. House, MFT.

While hosting senior state and local officials, the MSAT and MFT were proceeding with a group of civilians to the silo when they received indications on the fixed vapor sensing equipment of vapors on level three of the launch duct. Personnel were evacuated to the control center while the crew entered the appropriate emergency action checklists. Upon investigation with the portable vapor detector, no indications were evidenced in either the launch duct or silo equipment area. The crew deduced that the indications received were due to a malfunction of the fixed vapor sensing system. As a direct result of the professionalism they demonstrated during the performance of emergency actions, the civilian personnel on-site had an opportunity to observe first hand the response capabilities of Titan II crews.

MINUTEMAN CREW

1Lt Larry J. Colbert and 2Lt Mark A. Eunson, Crew R-073, 351SMW, are Minuteman Crew of the Month. While on alert tours they demonstrated outstanding ability to react in a calm and decisive manner to crisis situations. While working in the kitchen, a cook severely cut his arm and was losing a considerable amount of blood. The crew insured proper first aid medical care was administered and determined that the cook required immediate professional medical care but should not be moved. Wing command post was notified and the crew called the nearest hospital, briefed them and requested an ambulance. At the same time, Lt Eunson instructed the alarm response team (ART) to insure their vehicle was ready should it be needed. When the ambulance arrived at the LCF, the cook was placed in the ambulance and rushed to the hospital. Crew R-073 averted severe complications and possibly saved the life of an Air Force member.

HALL OF FAME

TACTICAL FLYING

OVER TWENTY-FOUR YEARS

170 AREFG, McGuire (NJANG)	None

OVER TWENTY-TWO YEARS

171 AREFW, Greater Pittsburgh (PAANG)	Mar '58
157 AREFG, Pease (NHANG)	June '58

OVER TWENTY-ONE YEARS

940 AREFG, Mather (USAFR)	May '59
307 AREFG, Travis	Sep '59

OVER TWENTY YEARS

151 AREFG, Salt Lake City (UTANG)	Feb '61

OVER NINETEEN YEARS

161 AREFG, Sky Harbor (AZANG)	Apr '61
126 AREFW, Chicago O'Hare (ILANG)	Apr '61
134 AREFG, McGhee Tyson (TNANG)	Aug '61
11 SG, Fairford	Feb '62

OVER EIGHTEEN YEARS

340 AREFG, Altus	Jun '62
96 BMW, Dyess	Aug '62

OVER SEVENTEEN YEARS

19 BMW, Robins	Aug '63

OVER SIXTEEN YEARS

160 AREFG, Rickenbacker (OHANG)	Dec '64

OVER FIFTEEN YEARS

320 BMW, Mather	Jul '65

OVER FOURTEEN YEARS

452 AREFW, March (USAFR)	Sep '66
92 BMW, Fairchild	Feb '67

OVER THIRTEEN YEARS

55 SRW, Offutt	Jul '67
2 BMW, Barksdale	Aug '67

OVER TWELVE YEARS

5 BMW, Minot	Feb '69

OVER ELEVEN YEARS

42 BMW, Loring	Sep '69
141 AREFW, Fairchild (WAANG)	Oct '69

OVER TEN YEARS

28 BMW, Ellsworth	May '70

OVER EIGHT YEARS

101 AREFW, Bangor (MEANG)	Mar '72
306 SW, Mildenhall	Apr '72
416 BMW, Griffiss	May '72
305 AREFW, Grissom	Aug '72

OVER SEVEN YEARS

379 BMW, Wurtsmith	Apr '73
931 AREFG, Grissom (USAFR)	Feb. '74

OVER SIX YEARS

384 AREFW, McConnell	Mar '74
189 AREFG, Little Rock (ARANG)	May '74
43 SW, Andersen	Dec '74

OVER FIVE YEARS

68 BMW, Seymour Johnson	Sep '75
6 SW, Eielson	Dec '75

ICBM

OVER SIXTEEN YEARS

1 STRAD, Vandenberg	Sep '64

OVER TEN YEARS

341 SMW, Malmstrom	Apr '70

OVER SEVEN YEARS

390 SMW, Davis-Monthan	Jul '73

OVER SIX YEARS

351 SMW, Whiteman	Oct '74
91 SMW, Minot	Nov '74

OVER FIVE YEARS

321 SMW, Grand Forks	Feb. '76

To gain listing in the Hall of Fame, a SAC or ARF unit must be Class A mishap-free for 48 months.

SAC SAFETY SCREEN

92 BMW, Fairchild Crew E-114: P Capt Arthur E Monroe, CP 1Lt Daniel R Simmons, N Capt Michael J Falvey, BO Sgt Kevin A Gerfen

28 BMW, Ellsworth Crew R-07: P Capt Jack A Wylie, CP Capt Rafel Herrera, RN Capt Bruce F Kreycik, N 1Lt Christopher A Dahlstrom, EW 1Lt Robert C Knox, G SrA Kelly E Fletcher

96 BMW, Dyess Crew S-31: P Capt Robert L Slaughter, ICP Capt John S Chilstrom, RN Maj Anthony W Aldebol, IN Capt Rex S Armstrong, IEW Capt Thomas G Schiotis, IG Sgt Andrew W Toth

96 BMW, Dyess Crew S-102: IP Maj David P Moore, CP 1Lt Patrick W Burke, IN Capt Harold D Wagner, IBO Sgt Larry P Vickers

5 BMW, Minot Crew R-44: P Capt Gary G Kiehlbaugh, CP Capt Albert G Singh, RN Capt Victor H Fordyce, N 1Lt Paul G Rouse, EW 1Lt Andre J Murphy, AG Sgt Thomas M Seabolt Jr

19 BMW, Robins Crew E-31: FP Capt Edgar A Gallup, CP 1Lt Dana L Evert, RN Capt Fred R Easterlin, NN 2Lt Keith C Abbott, EW Capt Harry B McCarraher III, AG SSgt Richard L Bradberry

19 BMW, Robins Crew E-107: FP Capt Dennis R Clark, CP 1Lt William P Womack, NN Capt Thomas F Veltri, BO TSgt Donald E Pressley

68 BMW, Seymour Johnson Crew R-07: P Capt Jerry L Maxwell, CP 1Lt Thomas M McCown, RN Capt Ronald M Harden, NN 1Lt George D K Walker, EW Capt John H Voss, AG TSgt Ronald W Sturgill

68 BMW, Seymour Johnson Crew R-110: P Capt Gary L Albaugh, CP Capt Richard S Thumser, NN 2Lt David A Milewski, BO TSgt Fred F McClure

97 BMW, Blytheville Crew R-10: AC Capt Larry W Northington, CP 1Lt David G Vanorsow, RN Capt Billy G Williams, NN 1Lt Johnnie R Madison, EW 2Lt John R Nanni, AG MSgt Thomas J Wiant, IP Capt Thomas W Ellers

97 BMW, Blytheville Crew E-33: AC Capt James R Greathouse, CP 1Lt William C Hoferer, RN Capt Steven J Redmann, NN Capt Herfried S Hellwege, EW 1Lt Joseph J Presutto, AG A1C James P Massey

97 BMW, Blytheville Crew E-117: AC Capt William T Snow, CP 1Lt Gert-Jan P Visser, CP 2Lt Steven E Wayne, NN 2Lt Harry J Davis II, BO SSgt Jeffrey L Boutwell

97 BMW, Blytheville Crew E-126: AC Capt Kenneth D Suggs, CP 1Lt Guy D Follansbee, NN 2Lt John C Hutsell, BO SSgt Lewis C Timbrook

379 BMW, Wurtsmith Crew E-151: AC Capt Grady W Massey Jr, CP 1Lt Jeffrey A Cramer, N 2Lt Robert N Brown, BO Sgt James W Handy Jr

379 BMW, Wurtsmith Crew E-42: IP Capt Kevin Clifford, FP Capt Robert L Ostrander, CP Capt Larry D Eickhoff, RN Capt Thomas A Loose, N 1Lt Ronald E Baughman, EW 1Lt Frederick F. Campbell, G A1C Ronald V Mayton

341 SMW, Malmstrom Crew E-135: MCCC 1Lt Edward S Mitchell III, DMCCC 2Lt Warren F Deaton II

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW SACR 127-2.*

*U.S. Government Printing Office
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